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ABSTRACT

Educational reform measures have forced schools to form partnerships with business and industry to achieve common goals of a prepared workforce. These partnerships have forced colleges of agriculture to examine its mission and update the curriculum. This study sought to provide benchmark data from employers on the skills and abilities deemed important and the level of preparation of recent agricultural and extension education graduates. Additional input was sought on the life experiences that were important for entry-level positions and the areas that would impact graduates in the future. Overall, graduates were prepared for entry-level position; however, several areas were identified where skills could be improved to match the expectations of the employers. The area of interpersonal skills was found to be the area where improvements were needed overall. The skills of teamwork, decision-making, leadership, and initiative were identified as needing the greatest improvement. The access and use of the Internet was the most important computer skills while presentations skills and verbalizing needed to improve in the communications skill area. Employers rated honesty, integrity, and dependability as very important abilities. (DDR)

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EMPLOYER PERCEPTION OF THE PREPARATION OF AGRICULTURAL AND EXTENSION EDUCATION GRADUATES

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Abstract

Educational reform measures have forced schools to form partnerships with business and industry to achieve common goals of a prepared workforce. These partnerships have forced colleges of agriculture to examine its mission and update the curriculum. This study sought to provide benchmark data from employers on the skills and abilities deemed important and the level of preparation of recent agricultural and extension education graduates. Additional input was sought on the life experiences that were important for entry-level positions and the areas that would impact graduates in the future. Overall, graduates were prepared for entry-level positions; however, several areas were identified where skills could be improved to match the expectations of the employers. The area of interpersonal skills was found to be the area where improvements were needed overall. The skills of teamwork, decision-making, leadership, and initiative were identified needing the greatest improvement. The access and use of the Internet was the most important computer skills while presentation skills and verbalizing needed to improve in the communications skill area. Employers rated honesty, integrity, and dependability as very important abilities

Introduction

Preparing graduates to work in a highly competitive global market is a major motivator for the fast forming partnerships between higher education and business and industry. Since the 1980s, school reform reports have called for changes that would ultimately transform the nature of education and business partnerships. Schools were graced with the need for educational reform measures that would better prepare a diverse student population for the higher order thinking and reasoning skills required in an increasingly knowledge-based, service-driven economy. Businesses were faced with the threat of an inadequately prepared work force that would jeopardize their competition with other industrialized nations. Motivated to improve the academic and technical skills of the future work force, businesses and schools joined in partnerships of various sizes and types to achieve their common and separate goals (Lankard, 1995).

The partnerships between higher education and business and industry have huge implications for agriculture. For more than a decade, employers have expressed a concern for the lack of graduates sufficiently trained to meet the challenges of a high-performance workplace. It has been proposed that the curriculum of agriculture was out of date and should be changed (Krunkel, Maw, and Skaggs, 1996). As a result, many colleges of agriculture are undergoing programmatic

changes and are reexamining the philosophy underlying their missions.

A decade of studies has found various needs desired by employers. Andelt, Barrett, and Bosshamer (1997) found that employers needed employees with leadership abilities, especially in the areas of problem solving and team work which were consistent with those of Klein (1990) who found that the ability to be a team player was important for employees to possess. Other skills identified by Klein included the ability to listen and carry out instructions, read and understand specific technical information, use general business computer software, interpret and use math and statistical methods, have a positive work attitude, high ethical values, and be self motivated. Radhakrishna and Bruening (1994) found that employees and students value interpersonal, business, and communication skills. Communication skills and customer relations skills was also reported by Foster (1989). Long, Straquadine, and Campbell (1992) found that graduates value knowledge and skills in the computer sciences and oral and written communication. Marciel (1994) reported that employers look for communication skills, attendance, and appearance when hiring new employees. In addition, a number of researchers have advocated the need for practical work experience (Merritt and Hamm, 1994). Brown and Fritz (1993) found there was a grave need for better leadership preparation for today's students to succeed in the workplace. Other findings from Blezek and Dillon (1991) indicate that graduates need honesty, integrity and fairness, interest in learning, positive work ethics, willingness to work, reading comprehension, written communication, math and computation skills. According to Klein (1990), educating students for a career in agriculture and natural resources demands greater skills plus a more holistic perspective on its interaction with society.

If agricultural industries are to survive, the agriculture curriculum must be dynamic and able to adjust to new situations and environments that help to improve on-the-job effectiveness of future graduates (Coorts, 1987, Slocombe & Baugher, 1988). Although higher education has been criticized regarding the absence of industry input in the decision making process (Long, Straquadine, and Campbell, 1992), this input is increasingly important due to the rapid technological advances. Such a partnership could be used to determine if changes are needed in the curriculum and extracurricular offerings. The more that is known about competencies needed in agriculture careers and is incorporated into curriculum development, the more employable agriculture graduates will be in the marketplace. Additionally, the input from employers would provide a benchmark against which future students would be compared and serve as an assessment indicator.

Due to changes in college curricula, increased technical competencies, and changing industry, there is a need to determine the entry-level knowledge, skills and abilities required of college graduates. By incorporating the desired skills into the college curriculum, graduates will be more qualified to adapt to the high-tech, fast paced jobs of the future. Students enrolled in these programs also need reassurances that the skills and abilities they learn will be meaningful to their future employment goals.

Purpose and Objectives

The purpose of this study was to determine knowledge, skills, and abilities desired of employers of entry-level graduates of the Department of Agricultural and Extension Education. The specific objectives were to:

1. Describe the level of preparation of knowledge, skills, and abilities needed for entry-level positions of agricultural and extension education graduates.

2. Describe the level of importance of knowledge, skills, and abilities of entry-level positions for agricultural and extension education graduates.

3. Determine if difference exists in the level of preparation and the importance of the knowledge, skills and abilities of agricultural and extension education graduates.

4. Describe the perceived value of experiential education in the curriculum of agricultural and extension education.

5. Describe the major trends which will be affecting the future preparation of agricultural and extension education graduates.

Methodology

The population of this study consisted of employers of entry-level graduates from the Department of Agricultural and Extension Education (AEED) from 1996 to 1999. This list was obtained from the Department of Agricultural and Extension Education alumni records. Duplications were removed leaving 37 different employers representing public schools, government agencies, banks, and agricultural businesses. A letter was sent to each employer in the study to explain the purpose of the study. Approximately two weeks after the pre-letter, the employer survey was mailed with an accompanying cover letter from the Dean of Agricultural, Food, and Life Sciences. A postcard and second survey was mailed to all late respondents. There were 20 employer surveys used in the study for a response rate of 54.1%. No differences were found in early and late respondents. According to Miller and Smith (1983), non-respondents are assumed to be similar to late respondents.

Instrument

The survey instrument was a self-administered questionnaire adapted from other studies used at Land Grant Institutions. It was modified to include statements of skills and abilities identified in the literature important to employers. A committee composed of 10 representatives from various agricultural disciplines validated the content of the survey questions.

The questionnaire was divided into four parts:

Part one of the questionnaires consisted of six questions designed to measure the preparation and importance of knowledge, skills, and abilities of entry level employees. The employer was asked to rate the preparation of the entry-level employee on interpersonal skills, communication skills, computer skills, character traits, and technical competency. The ratings were ranked in order for preparation from 1 being unprepared to 5 being thoroughly prepared. For the same set of skills and abilities, the employer was asked to rate the importance of these same skills with 1 being unimportant to 5 being extremely important.

Part two of the questionnaire related to the importance of certain life experiences for entry level employees. The life experiences included a career related internship, career related employment, general work experience, officer of a student club, active student club member, ability to speak more than one language, and international experiences such as exchange trips. These life experiences were ranked in order from 1 being not important to 5 being extremely important.

Part three of the questionnaire was associated with the perceived growth areas in the next five to ten years that would influence this field of study. Each respondent was asked to rank the top strength or growth areas from 1 being little growth to in the area to 7 being significant growth. In addition, there were open-ended questions pertaining to the trends and issues that could impact educational training of the graduates.

For the analysis, the mean scores were calculated and responses to importance of life experiences and future trends were ranked.

Findings

Objective 1

The first objective was to describe the level of preparation of AEED graduates from on entry level knowledge, skills, and abilities that included interpersonal skills, communication skills, computer skills, character skills and technical competencies.

Regarding interpersonal skills, the employers felt that the graduates of agricultural and extension education were best prepared in the area of initiative (Mean =3.72). Graduates were rated as prepared on all of the skills in the interpersonal areas with the mean ratings clustered around the mid-point signifying prepared for entry level positions. The means of decision-making, problem-solving, organizational skills, teamwork and etiquette had a mean score of 3.56. Having creativity and global awareness were the lowest rated interpersonal skills. No employer rated AEED students as thoroughly prepared on any of the interpersonal or adaptive skills. The mean values are shown in Table 1.

Agricultural and Extension Education graduates were most prepared to understand instructions (mean = 3.89) followed by listening (mean=3.83) on communication skills. Being

prepared to use the telephone effectively and verbalize their ideas received mean values of 3.59 and 3.56, respectively. The skills of AEED graduates, which were rated lower in preparation, included creative writing and presentation skills. Students were rated as somewhat unprepared in being able to speak another language with a mean score of 2.00.

Employers also rated the preparation of the entry-level computer skills. In general, employers rated AEED graduates as more prepared in word processing (Mean= 3.56) skills than other computer skills. Our graduates were rated below average in all other computer skills. Using computer aided design packages (Mean=3.21) was the skill that graduates have the least amount of preparation according to these employers.

Another component of entry-level preparation includes how well graduates exhibit a variety of character skills. As shown in Table 1, AEED graduates were rated somewhat equally on the character areas of honesty, dependability, and integrity with honesty having the highest overall mean of 4.00.

Employers were also asked to rate the level of preparation of graduates in the technical areas of the curriculum. This included areas in the biological sciences, physical sciences, humanities/arts, social sciences, mathematics, and agricultural sciences. Employers felt that graduates had good preparation in the agricultural sciences (Mean=4.00) and were prepared in all other areas. The mean score for preparation in the biological sciences was 3.71 and 3.52 in the physical sciences.

Table 1. Employer Mean Values of the Preparation of Skills of Agricultural and Extension Education Graduates

Interpersonal Skills	Mean	SD
Decision Making	3.56	0.70
Problem Solving	3.56	0.70
Management Skills	3.47	1.06
Organizational Skills	3.56	0.86
Leadership	3.50	1.04
Initiative	3.72	1.13
Creativity	3.44	1.04
Teamwork	3.56	1.14
Dedication	3.61	1.28
Appearance	3.61	1.14
Etiquette	3.56	0.85
Global Awareness	3.43	1.03
Open-Minded	3.56	0.98
Communication Skills		

	Mean	SD
Understanding Instruction	3.89	0.83
Telephone	3.59	1.00
Listening	3.83	1.61
Verbalizing	3.56	0.92
Technical Writing	3.38	0.85
Creative Writing	3.22	0.87
Presentation Skills	3.39	0.84
Second Language	2.00	0.91

Computer Skills		
	Mean	SD
Word Processing	3.56	0.70
Spreadsheets	3.31	0.60
Database	3.25	0.57
CAD	3.13	0.54
Graphics	3.25	0.58
Accounting systems	3.21	0.94
Internet access & use	3.35	0.63

Character Skills		
	Mean	SD
Honesty	4.00	0.91
Dependability	3.89	1.07
Integrity	3.89	0.96

Technical Competency		
	Mean	SD
Physical Sciences	3.52	0.71
Biological Sciences	3.71	0.59
Humanities	3.06	0.82
Social Sciences 3.29	0.92	
Mathematics	3.41	0.93
Agricultural Sciences	4.00	1.02

Scale: 5=Thoroughly prepared; 4=Good preparation; 3=Prepared; 2=Somewhat prepared; 1=Unprepared

Objective 2

The second objective was to describe the level of importance of the basic work-place

knowledge, skills and abilities for entry-level jobs. While it is important to know how prepared AEED graduates are to enter the work place, it is equally as important to know which skills are considered as the most important skills for the entry-level positions.

As show in Table 2, the skills of leadership, teamwork and dedication (Mean=4.56) were equally rated as very important interpersonal skills. Decision-making and problem solving were also highly rated with mean values of 4.38 and 4.39, respectively. All but two of the interpersonal skills were rated as very important.

Listening (Mean= 4.50) was rated as the most important communication skill by the employers. Understanding instruction and verbalizing were also rated as very important communication skills (Mean =4.44) along with presentation skills (Mean =4.11).

Word processing (Mean= 3.72) and internet skills (Mean =3.71) were the most important computer skills needed by graduates according to the employers in this study. All computer skills were rated as important for AEED graduates.

Employers value all of the character skills for entry-level employees. Honesty, dependable, and having integrity were all rated as highly desirable and important traits. All received the same mean importance value of 4.72.

Agricultural sciences (Mean =4.41) was the most important technical competency rated as very important by the employers for AEED graduates. Employers rated all of the other technical subject areas as important with mathematics being the next most important technical area of competency. Biological sciences and physical sciences, social sciences and humanities followed this.

Table 2. Employer Mean Ratings of Importance for Skills for Graduates for Entry Level Positions

Interpersonal Skills	Mean	SD
Decision Making	4.38	0.69
Problem Solving	4.39	0.50
Management Skills	4.00	0.76
Organizational Skills	4.28	0.46
Leadership	4.56	1.13
Initiative	4.39	0.50
Creativity	3.89	0.67
Teamwork	4.56	0.61
Dedication	4.56	1.28
Appearance	4.23	0.56
Etiquette	4.11	0.69
Global Awareness	3.56	0.86

Open-Minded		4.22	0.73

Communication Skills		
	Mean	SD
Understanding Instruction	4.44	0.51
Telephone	3.58	1.00
Listening	4.50	1.29
Verbalizing	4.44	0.61
Technical Writing	3.67	0.90
Creative Writing	3.35	0.93
Presentation Skills	4.11	0.76
Second Language	2.43	1.22

Computer Skills		
	Mean	SD
Word Processing	3.72	0.46
Spreadsheets	3.43	0.62
Database	3.43	0.63
CAD	3.12	0.95
Graphics	3.27	0.96
Accounting	3.20	0.94
Internet	3.71	0.61

Character Traits		
	Mean	SD
Honesty	4.72	0.46
Dependability	4.72	0.46
Integrity	4.72	0.46

Technical Competency		
	Mean	SD
Physical Sciences	3.63	0.71
Biological Sciences	3.71	0.58
Humanities	3.25	0.85
Social Sciences	3.31	0.87
Mathematics	3.94	0.44
Agricultural Sciences	4.41	0.71

Scale: 5=Extremely Important; 4=Very Important; 3=Important; 2=Somewhat important; 1=Unimportant

Objective 3

The third objective was to determine the differences of the level of preparation and the importance of the knowledge, skills and abilities of AEED graduates for entry-level positions. The mean of the difference between the response for preparation and the response for importance was computed. All mean values for preparation were lower than the mean of importance of each variable. The skill of teamwork was rated with the greatest difference of 1.00. With the exception of global awareness and creativity, all other skills ranked had a mean difference of .50 or greater. These values are shown in figure 1.

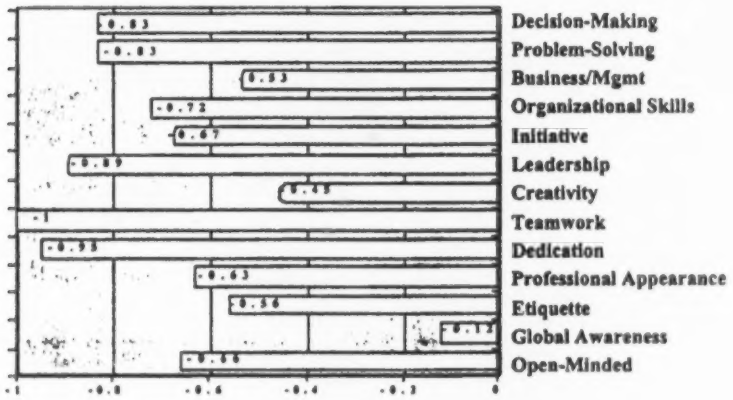

Figure 1: Mean of the Differences of Preparation and Importance of Interpersonal Skills

Communication skill mean differences are shown in figure 2. Verbalizing, presentation skills, listening, and understanding instructions were communication skills perceived by employers to be very important. All of the AEED graduates were rated lower for their preparation on these skills than the importance of the skill rating by the employer.

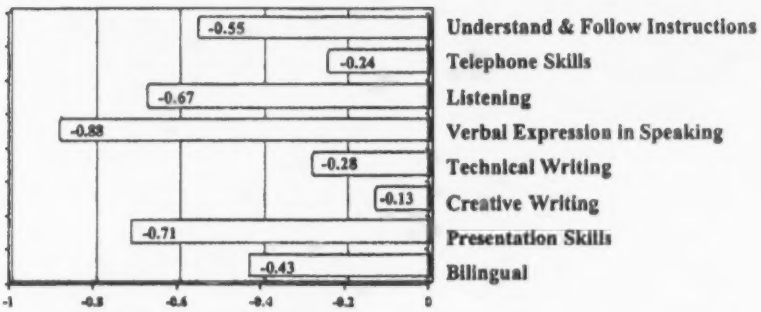

Figure 2: Mean of the Differences of Preparation and Importance of Communication Skills

The greatest difference of preparation and importance on computer skills was the ability to access and use the Internet. Overall, these differences were less than other skills noted by the employers. There were two skills, computer aided design and computerized accounting systems, which the importance of the skill was rated less important than the preparation level of the entry-level graduate.

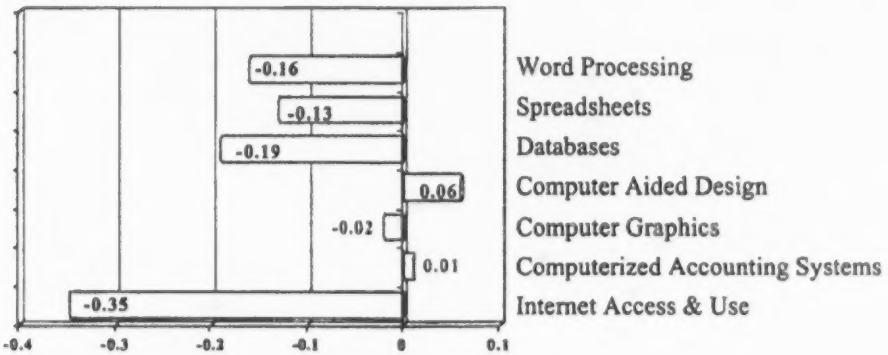

Figure 3: Mean Differences of Preparation and Importance of Computer Skills

Character traits were the highest of all of the skills or abilities by employers with all rated as very important. While our students were rated highly, employers placed a very high value on integrity and dependability.

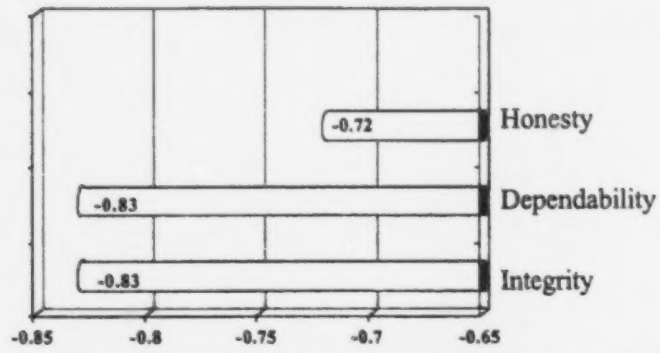

Figure 4: Mean Differences of Preparation and Importance of Character Traits.

The mean differences were greatest for mathematics and the agricultural sciences when preparation and importance was compared. Slight differences were found in social sciences, and physical sciences with no difference of mean scores in the biological science area as shown in Figure 5.

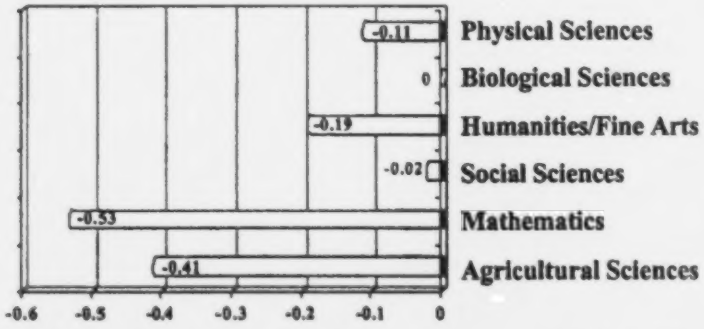

Figure 5: Mean Differences of Preparation and Importance of Technical Competencies.

Objective 4

Employers were also asked to rate a series of life experiences that they felt were important for success on the job for AEED graduates. These employers rated having general work experience as the most important experience (Mean =3.75) followed by having work experience on a farm (Mean=3.44) and being reared on a farm (Mean=3.11). All mean scores are shown in Table 3.

Table 3. Mean ratings of life experiences important for entry level agricultural and extension education graduates

Life Experience	Mean	S. D.	Rank Order
Reared on a farm	3.11	0.78	4
Work experiences on a farm	3.44	0.53	2
Agricultural internships	2.89	0.93	6
Agricultural employment	3.22	0.97	3
General work experience	3.75	0.71	1
Officer of a student club	3.00	0.76	5
Active student club member	2.89	0.93	7
Bilingual	2.43	1.39	8
International experience such as Exchange trips	2.50	0.93	9

Scale: 1=not important; 2=somewhat important; 3=important; 4=very important; 5=extremely important

Objective 5

These employers ranked future growth areas that would impact or change agriculture for the next 5-10 years. The mean scores of these growth areas are listed in Table 4. The employers rated computer systems (Mean =5.86) and research and development (Mean=5.75) as the most likely areas to influence agriculture in the next 5-10 years. Technical consulting, environmental issues and quality control were also rated as strong growth areas with mean scores of 5.63.

Table 4. Growth areas which may impact agricultural and extension education graduates in the future

Growth Areas	Mean	S. D.	Rank Order
Sales	4.75	1.03	9
Management	5.13	0.99	8
Environment	5.63	0.52	3
Quality Control	5.63	0.52	3
Mechanical	4.71	0.76	11
Marketing	5.63	0.91	3
Research and Development	5.75	0.88	2
Consumer Relations	5.63	0.74	3
Computer Systems	5.86	0.69	1
Education and Training	5.43	0.79	6
Communication	5.43	0.97	6
International Agriculture	4.86	1.46	10

Conclusions and Recommendations

In general, our students are prepared to enter into entry-level positions. Only the skill or ability to speak a second language was rated as unprepared by the employers of AEED graduates. However, when compared to the level of importance placed on the interpersonal skills and abilities, it appears that our students need to improve in the area of professionalism. Our graduates need to demonstrate the ability to work in groups, show leadership, dedication, and initiation more than they are now doing. It may also be that graduates exhibit "on-the-job awkwardness." These perceptions may simply be a lack of maturity or business savvy that all graduates have without a few years of on the job training. AEED students are proficient in computer skills, except the use of the Internet. CAD and accounting systems were rated as the least area of preparation. With the increased impact of the Internet, these skills will have a more immediate impact of need than some of the other computer skills. In the communication skill area, employers rated verbal expression, presentation skills, listening, and understanding instructions as very important. All character traits were very important to the employers.

Employers felt that having general work experience was an influencing factors for success for entry-level employees. They also felt having experiences in an agricultural work area and being raised on a farm were important for AEED graduates. Computer systems, research and development, the environment and quality control areas were rated as impact areas influencing the future of AEED graduates.

Based on these findings, it is recommended that the department examine the following changes in the curriculum to minimize the differences of the level of preparation and importance of each of these skill areas:

1. Explore the adoption of senior projects, colloquia, or other avenues to acquire skills in communication, problem solving, and decision-making.

2. Require more writing and presentation as part of the total degree program.

3. Incorporate more "hands-on" teaching in the class room. If agriculture is truly an applied science, then our students must be given the opportunity to apply the science they have learned in their course work. The employers have indicated our students are book smart, however, they lack the skills of a professional that comes from exposure to real situations.

4. Incorporate the use of computer skills with more course assignments.

5. Organize an advisory committee to seek on-going input into the curriculum.

6. Continue to administer employer and alumni studies for feedback.

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